

WHAT IS CLAIMED IS:

1 1. A distributed sensing system in a networked environment for
2 identifying an analyte, said system comprising:

3 a first sensor array connected to said network comprising sensors capable of
4 producing a first response in the presence of a chemical stimulus;

5 a second sensor array connected to said network comprising sensors capable of
6 producing a second response in the presence of a physical stimulus; and

7 a computer connected to said network having an algorithm wherein said first
8 response and said second response are processed to identify said analyte.

1 2. The system according to claim 1, wherein said algorithm selects
2 the most relevant sensor modality in said first and said second array to identify said
3 analyte.

1 3. The system according to claim 1, wherein each sensor of said first
2 sensor array is a member selected from the group consisting of a bulk conducting polymer
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic
4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

1 4. The system according to claim 1, wherein each sensor of said
2 second sensor array is a member selected from the group consisting of an optical sensor, a
3 mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

1 5. The system according to claim 3, wherein each sensor of said first
2 sensor array is a conducting/nonconducting regions sensor.

1 6. The system according to claim 4, wherein each sensor of said
2 second sensor array is an optical sensor, a mechanical sensor, a radiation sensor, a
3 thermal sensor and combinations thereof.

1 7. The system according to claim 1, wherein the transmission of said
2 first response is conducted via wired communications.

1 8. The system according to claim 1, wherein the transmission of said
2 first response is conducted via wireless communications.

1 9. The system according to claim 8, wherein said wireless
2 communications are implemented using communications technologies selected from a
3 member of a group consisting of infrared technology, satellite technology, microwave
4 technology and radio wave technology.

1 10. The system according to claim 1, wherein said networked
2 environment is a member selected from the group consisting of a worldwide computer
3 network, an internet, the Internet, a wide area network, a local area network, an intranet
4 and combinations thereof.

1 11. The system according to claim 1, wherein said networked
2 environment is the Internet.

1 12. A device for monitoring an analyte in an environment, said device
2 comprising:

3 at least one sensor array, wherein said at least one sensor array comprises
4 at least two sensors capable of producing a first response in the presence of a chemical
5 stimulus;

6 a second sensor which is capable of producing a second response in the
7 presence of a physical stimulus;

8 a connector that connects said at least one sensor array and said second
9 sensor to a central processing unit, said central processing unit collects and stores said
10 first and second responses; and

11 an analyzer configured to analyze a plurality of responses wherein said
12 analyzer monitors said analyte in said environment.

1 13. The device according to claim 12, wherein said second sensor is an
2 array of sensors.

1 14. The device according to claim 12, wherein said device is a
2 handheld device.

1 15. The device according to claim 12, wherein each of said at least two
2 sensors is a member selected from the group consisting of a bulk conducting polymer
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic

4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

1 16. The device according to claim 15, wherein each of said at least two
2 sensors is a conducting/nonconducting regions sensor.

1 17. The device according to claim 13, wherein each sensor in said
2 second sensor array is a member selected from the group consisting of an optical sensor, a
3 mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

1 18. The device according to claim 14, wherein said handheld device
2 further comprises a communication interface coupled to the processing device and
3 configured to communicate with a computer network.

1 19. A method for transferring a combination of chemical and physical
2 data over a computer network for identification of an analyte, said method comprising:
3 transmitting sensory data from a first sensor array comprising sensors
4 capable of producing a first response in the presence of a chemical stimulus to a remote
5 location;
6 transmitting physical data from a second sensor array comprising sensors
7 capable of producing a second response in the presence of a physical stimulus to a remote
8 location; and
9 processing said sensory and physical data at said remote location for
10 identification of an analyte.

1 20. The method according to claim 1, further comprising employing a
2 sensor selection algorithm to determine sensors in said first array.

1 21. The method according to claim 1, wherein each sensor of said first
2 sensor array is a member selected from the group consisting of a bulk conducting polymer
3 film, a semiconducting polymer sensor, a surface acoustic wave device, a fiber optic
4 micromirror, a quartz crystal microbalance, a conducting/nonconducting regions sensor, a
5 dye impregnated polymeric coatings on optical fiber and combinations thereof.

- 1 22. The method according to claim 1, wherein each sensor of said
2 second sensor array is a member selected from the group consisting of an optical sensor, a
3 mechanical sensor, a radiation sensor, a thermal sensor and combinations thereof.

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